Psychology 435: Pollution and Psychological Development
Spring 2017
Wednesday 1:00 – 3:30
Sewall Hall 462

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Office Hours: T 1:00 – 2:00 and by appointment

Course goals

1. To learn about some of the ways in which environmental hazards influence psychological functioning and development.
2. To learn about how attitudes, beliefs, and values affect decision processes and policies related to pollution.
3. To understand why there is disagreement in some cases even among scientists over "safe" levels of environmental pollutants.
4. To improve your written and oral communication skills.
5. To improve your library and electronic research skills as a student-scholar; to learn to distinguish among and critically evaluate different sources of information.
6. To have fun spending 2.5 hours each week discussing matters that are of vital importance to my, your and future generations.

Required Text: Moore, C. F. (2009). *Children and Pollution: Why Scientists Disagree.* New York: Oxford University Press (ISBN 978-0-19-538666-0).

Course Organization and Grading

- 10% of your grade will be based on participation in class discussions.
- 20% of the course grade will be based on completing various written assignments. I give feedback on each assignment so that you can improve your writing skills. Some written assignments will be point-graded, and will count proportionately in the 20% allotted to written assignments. Other written assignments will not be graded with points, but rather simply recorded with a check as having been submitted and as being adequate. I will make clear which of these grading schemes goes with which assignment.

- 20% of your grade will be based on leading discussions on empirical research articles. You will lead the discussion on approximately 3 articles during the course of the semester. You do not have to prepare a formal presentation on the article that you are discussing. You are just expected to lead a discussion and ask questions that the other class members will answer. Additionally, twice during the semester, I will ask you to find an article on your own on a particular topic, and you will give a PowerPoint/Keynote presentation on that article in class.
- 10% of your grade will be based on an oral presentation at the end of the semester on your final paper. In other words, everyone will write a final paper on a mutually-agreed-upon topic, and before that paper is submitted, you will present the highlights of that paper to the class using PowerPoint, Keynote, or any other acceptable presentation medium.
- 20% of your grade will be based on a take-home midterm exam. This midterm exam will consist of answering questions on the articles that we read and discussed up to that point in the semester. This means that if you fail to read the articles when they are assigned during the first part of the semester, then you will have to read all of them at the time that you write your answers to the midterm. I would strongly advise against that strategy. Additionally, failing to read the articles when they are assigned will mean that you will have a difficult time contributing to the in-class discussion, and that will reflect negatively on your course participation.
- 20% of the grade will be based on a final paper. The final paper will be on a topic chosen by the student but must be relevant to the course, and it must be approved by me. There are several written assignments leading up to the final paper; these assignments will be ungraded, but your term paper will not be accepted unless these preliminary assignments are completed. The preliminary assignments consist of things like writing a topic sentence, writing the first paragraph of the paper, writing a rough draft of the paper, etc.

Writing assignments will be due 24 hours before the next class period. So if you receive a writing assignment in class, for example, then that writing assignment should be submitted online by Tuesday at 1:00 PM before the next class period.

Please submit all assignments in your Dropbox online at the OwlSpace web site for the course. All written assignments should be submitted double-spaced as Word or Pages documents. When an assignment calls for 1-2 pages, this means 1-2 double-spaced pages.

Course Procedures

This will not be a lecture course, although I will lecture occasionally. The course will be a seminar in which we discuss the readings. I believe strongly in the power of collaborative learning, so we will spend a good deal of time simply working through articles in class, discussing them and helping each other to understand the issues. This means that you will have to be prepared for class so that you can contribute to the learning.

Central Theme and Issues

An important phenomenon in assessing the effects of pollution on development is that scientists can disagree about the importance or strength of the impact of certain events (for example, a type of pollution, negative effects of extraction of a natural resource, etc.) on both the well-being of humans and on our care for the natural environment. Some of the organizing themes of this course will be:

- Why do scientists some times disagree about the effects of pollution on development?
- Are there different ways of determining safe levels (e.g., threshold dose) of an environmental pollutant?
- How are the effects of various pollutants on physical and psychological development determined? Are animal models of development relevant when it comes to understanding the potential effects of various pollutants?
- How do policy makers use the information provided by scientists in formulating policy at both the local and national levels on allowable exposures to various pollutants?
- What is the best way to address scary reports in the media regarding pollution and development?
- At the end of the course, you should be able to speak intelligently about these risks without exaggerating or understating them.

Approximate class and assignment schedule

Date	Topic	Class Period
11-Jan	Introducttion & the video "The Creek Runs Red"	1
18-Jan	Early Nervous system and cognitive development	2
25-Jan	Early Nervous system and cognitive development	3
1-Feb	Approaches to assessing and regulating risk	4
8-Feb	Lead	5
15-Feb	Lead	6
22-Feb	Mercury	7
1-Mar	Mercury (including vaccine controversy)	8
8-Mar	PCBs	9
15-Mar	SPRING BREAK - NO CLASS	
22-Mar	Pesticides	10
29-Mar	Bisphenols - endocrine disruptors	11
5-Apr	Air pollution	12
12-Apr	Student presentations	13
19-Apr	Student Presentations	14
	Number of class periods	**14**

26-Apr	Beginning of Exam period
28-Apr	**Final Paper Due**
3-May	End of Exam period
5-May	Final grades for Degree Candidates due

Readings for each class period will be announced on Owlspace and listed on the Owlspace schedule/calendar.

Writing assignments (all writing assignments are due by 1:00 PM, 24 hours before the next class period. That usually means that they are due on Tuesdays by 1:00 PM in your Owlspace Dropbox). The data shown with each assignment is the Tuesday due date immediately before the next class period.

These assignments will also be placed on the Owlspace schedule/calendar

January 17

Writing Assignment #1 (1-2 pp - points)

Write a **reaction paper** to the video *The Creek Runs Red*. In your paper you may address **any issues or questions that you would like**. Examples of some questions would be:

a) What choices did people make that led to the events shown in this video?

b) Did the pollution shown in this video have an equal impact on children and adults regardless of income or financial resources?

c) Why might some people choose to stay in this town even after they know the risks?

These are just suggested question. You are free to react to the video as you see fit.

January 24

Writing Assignment #2a (1-2 pp - points)

Write a brief bio of yourself to be shared with the class. Include your interests, major, why you are taking the class, and any other information that you think is relevant.

Writing Assignment #2b (1-2 Powerpoint or Keynote slides - checks)

Find the location of a Superfund site in Harris County, TX or any other site in the US that is of interest to you (e.g., your hometown). Show the location of the site on a map. Answer the following questions:

1. What pollutant(s) was(were) responsible for the environmental contamination?
2. What company(ies) was(were) responsible for the contamination?
3. Are remediation efforts still underway, or have the remediation efforts been completed?
4. List a reference to a scientific paper that has studied the effects of the contaminant(s) listed in point 1 above on children or on adults.

January 31

Writing Assignment #3 (1-2 pp – points)

In the Prologue to *Children and Pollution*, Colleen Moore discusses two different approaches to regulating the risk from potential environmental toxins such as lead. Briefly define and

discuss these two approaches. The two approaches place the burden for determining whether or not a substance is dangerous to health and development on different stakeholders. Discuss how the burden for determining safety is distributed using these two approaches. Why do you think it has been difficult for the United States to adopt the Precautionary Principle as its primary rule for determining environmental safety?

February 14

Writing assignment #4 (1-2 pages – points)

Find a news item about the ongoing Flint, MI lead contamination of the water supply. The news item should be reasonably comprehensive, not merely a brief paragraph. The source can be any legitimate media outlet: print, online, radio, video, etc. Write a synopsis of the news item.

1. Are different scientific findings or scientific controversies considered?
2. Is there any mention of ethical or decision issues?
3. Does the news item consider issues of fairness and social justice; for example, does it consider differential impact on children depending on their parents SES level?

(We will discuss these in class.)

February 14

Writing assignment #5 (1-2 pp – points)

Ernhart et al. (1985) and Needleman (1986) disagreed about "safe" levels of lead partly because they took different stances on whether it was legitimate to interpret results that did not quite meet the $p < .05$ standard of social science. Write a commentary on the implications of interpreting research findings that do not quite meet the .05 standard. Are there some research topics for which a strict p-level should be used (say, .01) and others for which a lax standard (say, .10) should be used? (You might want to include issues of include statistical power in your commentary.)

February 21

Oral presentation assignment #1 (Produce a PowerPoint or Keynote Presentation – 15 minutes - points)

Find an original research article on how mercury exposure affects some aspect of psychological functioning, behavior or development. The article can be about wildlife, lab animals or humans, children or adults, something covered in the chapter, or something not covered. You will give a presentation of the article in class. The presentation should give us a good summary of the article, and a commentary on it. Please prepare your presentation using PowerPoint, Keynote or a similar computer presentation program.

February 28

Writing assignment #5 (2-3 pp – points)

Find a news item on the vaccine-autism controversy (that is, whether the mercury preservative in childhood vaccines is linked to a recent increase in autism). Does the author of the news item take a position on this controversy? Find the original research publication that led to this claim of a link between vaccines and autism. Read the article. How convinced were you by the data in this article that there is a causal link between the mercury in vaccines and autism? Find a more recent assessment of this hypothesis in the scientific literature. What is the conclusion of this more recent assessment?

March 7

Writing assignment #6 Take-home Midterm (points)

Answer the questions that I present on the articles and chapters that we have read up to this point in the semester. Do not simply cut and paste answers from the articles themselves. You must state your answers in your own words.

March 21

Oral presentation assignment #2 (PowerPoint or Keynote slides, 15 minutes – points)

Summarize and comment on a behavioral neuroscience article on how pesticide exposure affects behavioral development in lab animals. Take a position on how relevant you think these results are for human development.

March 28

Writing assignment #7 (1-2 pp – points) Choose a) or b)

a) Find a news item on the effects of Bisphenol-A or other endocrine disruptors on infants or children. Summarize the news item. Does the author cite scientific studies on the possible effects of these chemicals on development?

b) Find a web site sponsored by a chemical manufacturer of Bisphenols or an entity that lobbies for these chemical manufacturers of Bisphenols. Include the link to this site in your brief paper. Is it obvious on the landing page for this web site that it is sponsored by a company that manufactures Bisphenols or a representative entity for such companies. In other words, is the site transparent in regards to its position on the safety of these chemicals. Does the web site cite scientific studies in support of its position on the safety of these chemicals?

April 4

Writing assignment #8 (1-2 pp – checks)

Produce a PowerPoint or Keynote slide with a plot that shows historical data for some aspect of Houston air pollution (e.g., ozone, particulate matter < 2.5 micrometers) over any three years in the range from 2001 to 2016). For example, ozone is usually reported each day on an hourly basis. You could plot the ozone measurement at midnight for every day of the year and do this for three different years. Do you notice any obvious or possible trends over the three years in the level of this pollutant? Are the levels of this pollutant generally within a healthy range as defined by the EPA. If you can find the data, also generate a similar plot for Beijing, China and answer the same questions. The years for the Beijing data do not have to be the same as the years for the Houston data. We will examine these plots in class.

Term Paper Assignments (Due dates will be announced)

These assignments will be interwoven with the other assignments. My goal is make the term paper project an integral part of the course rather than a last minute panic job. The sequence of assignments is designed to help you develop your project systematically over the course of the semester. It is never too early to begin thinking of a term paper topic. One way to get ideas for topics is to browse the readings in the course website, browse abstracts of articles, or (even!) go to the library (electronically or in person) and browse recent issues of relevant journals.

Term Paper Assignment #1. Submit your topic. **Write at least a sentence or two** about a topic on which you would like to write your paper. Some students have several ideas and are undecided about which one to pursue. It is fine to give a couple of different ideas. I will give you feedback that might help you find some direction.

Term Paper Assignment #2. Submit an opening introductory paragraph on your term paper topic, and a bibliography of at least a few references. The paragraph should include a thesis statement describing the main theme of your paper. Of course, as you develop the paper the thesis will evolve.

Term Paper Assignment #3. Submit a 2-3 page section of your term paper and a bibliography with more references than you had for Assignment #2. The section can be: a) the introduction, describing the thesis and laying out the background for the rest of your paper, b) a summary and critique of an empirical research paper that will be incorporated in your term paper, or c) a one page abstract or summary of your entire paper including an outline of the paper and an annotated bibliography (a bibliography with about two sentences summarizing each item in the list).

Term Paper Assignment #4. Draft and peer feedback. You will turn in a draft of your entire paper. Each student will provide feedback to another student on the term paper draft. I will give you further information on the peer feedback exercise later. My classes in the past have found it very helpful.

Final Paper Due: April 28 by 5:00 PM. Submit your final paper on Owlspace in your

Dropbox as a Word, Pages, or some other document format on which I can easily place electronic comments and corrections.

Absence Policies

You are expected to attend every class unless there is an emergency, death in the immediate family (grandparents, parents, siblings), or a religious obligation. Please email me BEFORE CLASS if you are going to be absent from class, and include the reason for your absence.

If you are absent for an excused reason, then I will allow you to make up the assignments that you missed within a week of when they were due. If for some reason you cannot complete the answers to the article questions from a given week, I will record a 0 for your grade on that assignment.

Rice Honor Code

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at http://honor.rice.edu/honor-system-handbook/. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

Disability Support Services

If you have a documented disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with Disability Support Services (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

Syllabus Change Policy

This syllabus is only a guide for the course and is subject to change with advanced notice.